

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,710,831 B1
 DATED : March 23, 2004
 INVENTOR(S) : Bruce Winker et al.

Page 1 of 12

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Delete Title page illustrating a Drawing Figure, and substitute therefor Title page illustrating a Drawing Figure. (Attached)

Delete Drawing Sheets 1-10, to be replace with Drawing Sheets 1-10. (Attached)

Title page.

Item [56], **References Cited**, OTHER PUBLICATIONS, delete the following:

"Saji, T., et al., "Short-Term Hemodynamic Effect of a New Oral PG12 Analogue, Beraprost, in primary and Secondary Pulmonary Hypertension," Am.J. Cardio. 78:244-247 (1996)

Sakoda, T., et al., "Myristoylation of endothelial cell nitric oxide synthase is important for extracellular release of nitric oxide," Mol. Cell. Biochem. 152:143-148 (1995).

Sandig, V., and Strauss, M., "Liver-directed gene transfer and application to therapy," J. Mol. Med. 74:205-212 (1996)."

Below **ABSTRACT**, "6 Claims, 18 Drawing Sheets" should read -- 9 Claims, 10 Drawing Sheets --.

Column 14.

Line 25, add claims 7-9 as follows:

7. A tunable mirror comprising:

a negative quarter-wave to positive quarter-wave (+/- $\lambda/4$) retarder, being controllably switchable between - $\lambda/4$ and + $\lambda/4$ states of operation,

whereby in the + $\lambda/4$ state, said retarder circularly polarizes linearly polarized light of a first linear direction to circularly polarized light of a first rotational direction, and linearly polarizes circularly polarized light of the first rotational direction to linearly polarized light of the first linear direction, and, in the - $\lambda/4$ state, said retarder linearly polarizes circularly polarized light of a second rotational direction to linearly polarized light of the first linear direction; and

a cholesteric reflector optically aligned with the +/- $\lambda/4$ retarder, for reflecting circularly polarized light received from the +/- $\lambda/4$ retarder having a polarization of the first rotational direction, back through the +/- $\lambda/4$ retarder, and transmitting circularly polarized light of the second rotational direction towards the +/- $\lambda/4$ retarder,

such that the tunable mirror reflects linearly polarized light of the first linear direction, received through the +/- $\lambda/4$ retarder from a side opposite the cholesteric reflector when the +/- $\lambda/4$ retarder is in the + $\lambda/4$ state, and transmits circularly polarized light of the second rotational direction received through the cholesteric reflector, on a side opposite the +/- $\lambda/4$ retarder when the +/- $\lambda/4$ retarder is in the - $\lambda/4$ state.

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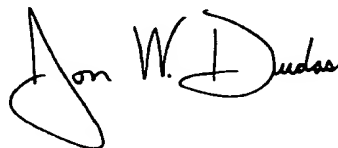
Column 14 (cont'd).

8. The tunable mirror of claim 7, wherein the cholesteric reflector is a diffuse reflecting cholesteric liquid crystal film.

9. The tunable mirror of claim 8, wherein the $\pm \lambda/4$ retarder comprises a $0-\lambda/2$ retarder and a $\lambda/4$ retarder.

Signed and Sealed this

Thirtieth Day of November, 2004



JON W. DUDAS
Director of the United States Patent and Trademark Office

(12) **United States Patent**
Winker et al.

(10) Patent No.: **US 6,710,831 B1**
(45) Date of Patent: **Mar. 23, 2004**

(54) **HIGH BRIGHTNESS TRANSFLECTIVE LCD AND METHOD USING TUNABLE MIRROR**

WO WO3701789 1/1997
WO WO9838547 9/1998
WO WO0063745 10/2000

(75) Inventors: **Bruce Winker, Ventura, CA (US);
William J. Gunning, Newbury Park,
CA (US)**

(73) Assignee: **Rockwell Scientific Licensing, LLC,
Thousand Oaks, CA (US)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 300 days.

(21) Appl. No.: **09/676,138**

(22) Filed: **Sep. 29, 2000**

(51) Int. Cl.⁷ **G02F 1/13**
(52) U.S. Cl. **349/115**
(58) Field of Search **349/115, 77, 74,
349/113, 114**

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Machine translation of 10-206844 pp. 1-20.*

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Sakoda, T., et al., "Myristoylation of endothelial cell nitric oxide synthase is important for extracellular release of nitric oxide," *Mol. Cell. Biochem.* 152:143-148 (1995).

Sandig, V., and Strauss, M., "Liver-directed gene transfer and application to therapy," *J. Mol. Med.* 74:205-212 (1996).

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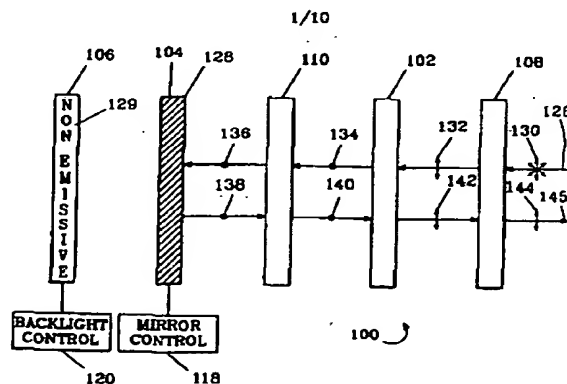
Primary Examiner—James A. Dudek

(74) Attorney, Agent, or Firm—Koppel, Jacobs, Patrick & Heyblk

(57) **ABSTRACT**

A Liquid Crystal Display (LCD) uses a tunable mirror in place of a partially reflective mirror. The tunable mirror has a controllable reflectivity and transmittance which allows the mirror to primarily reflect light when the LCD is operated in a reflective mode, and to primarily transmit light from a backlight when the LCD is operated in a transmissive mode.

6 Claims, 18 Drawing Sheets



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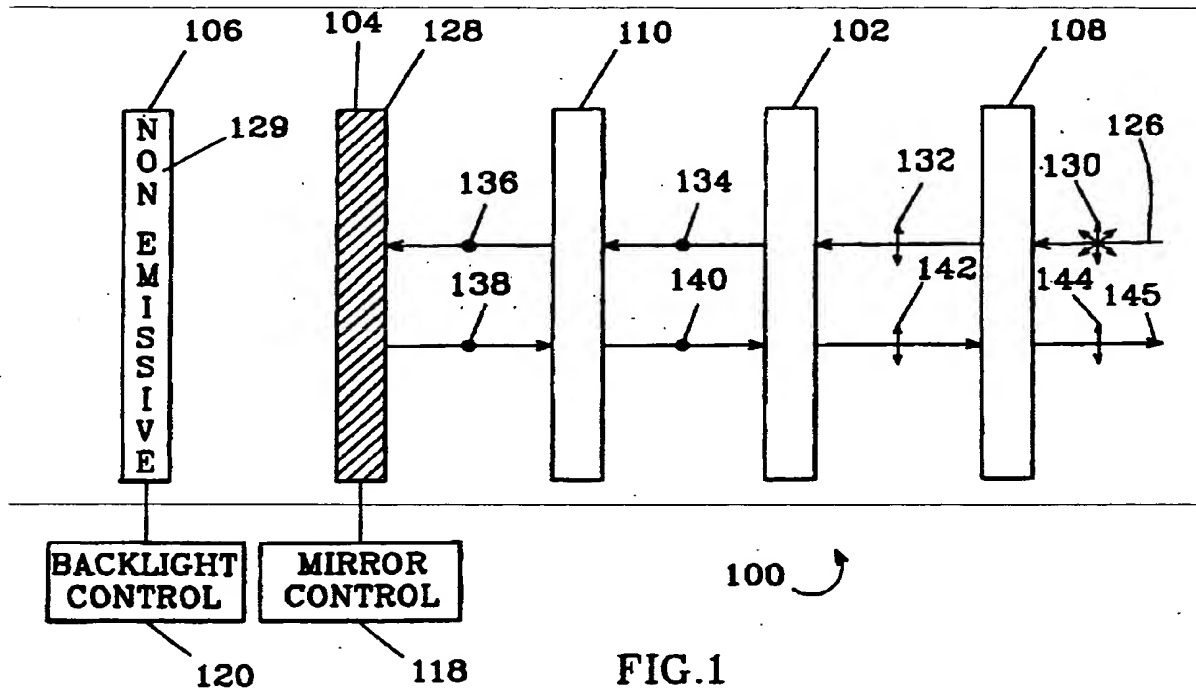


FIG. 1

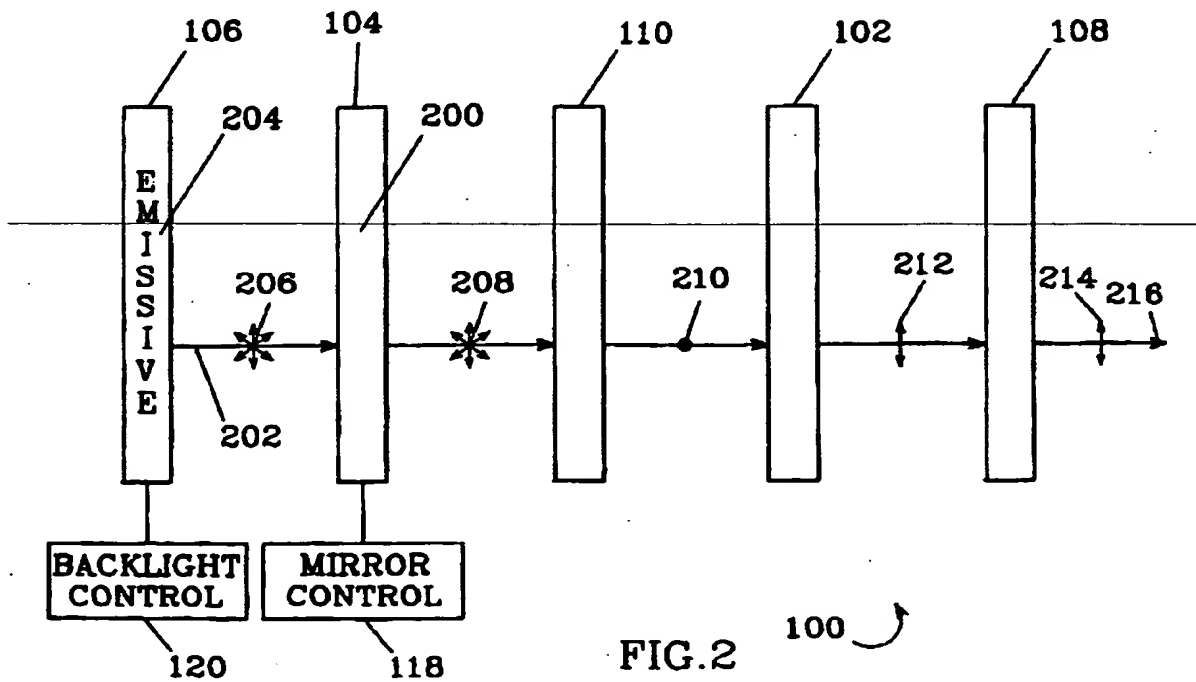


FIG. 2

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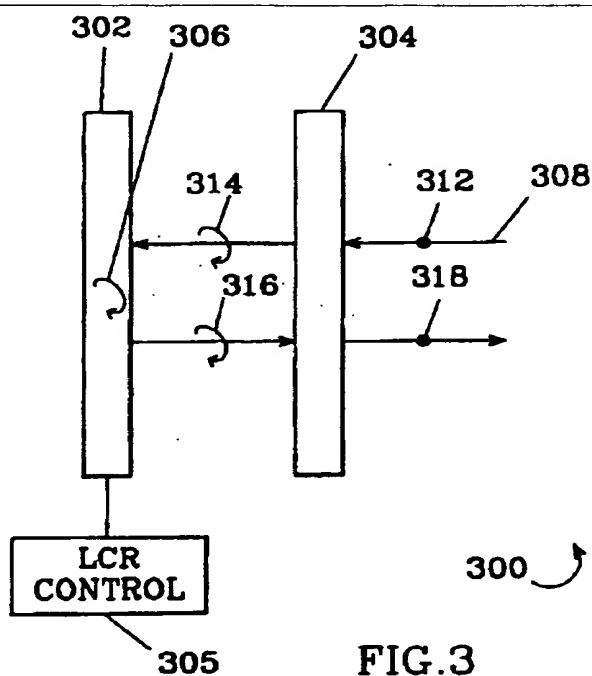


FIG. 3

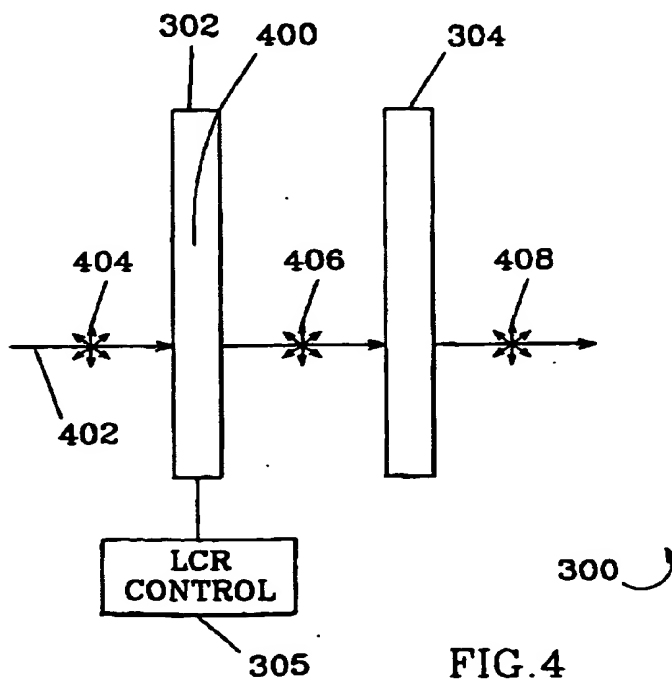


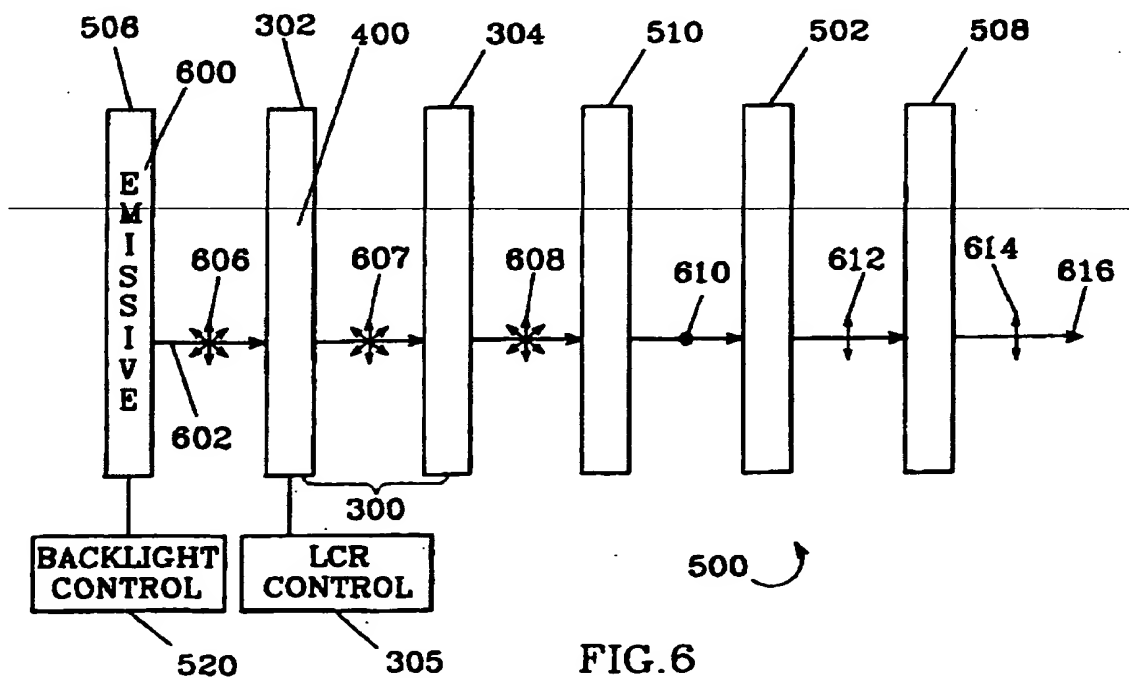
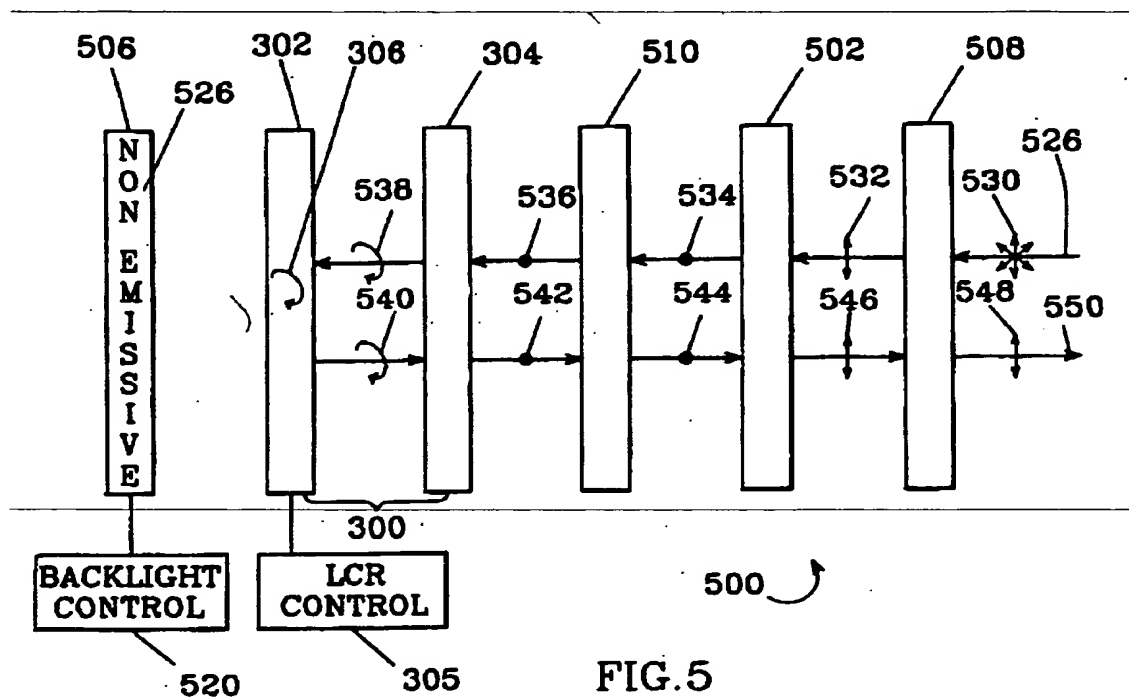
FIG. 4

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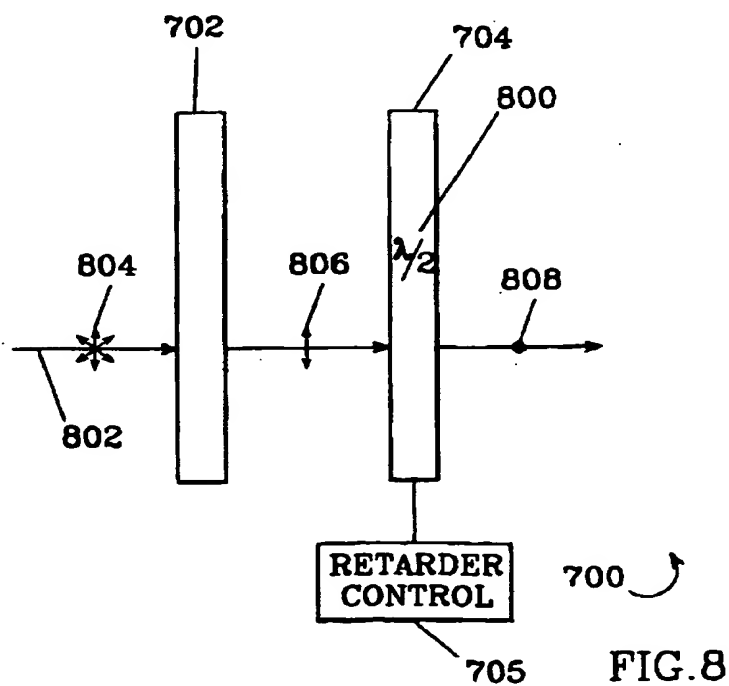
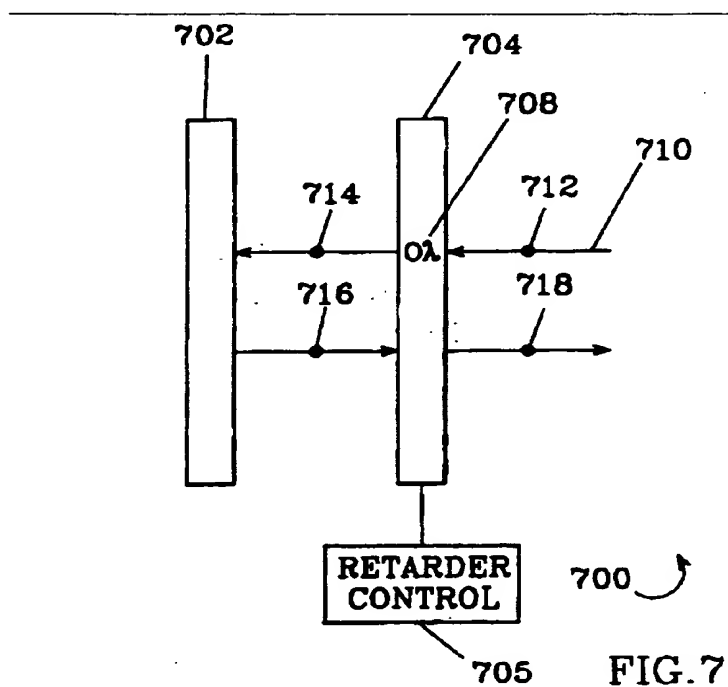


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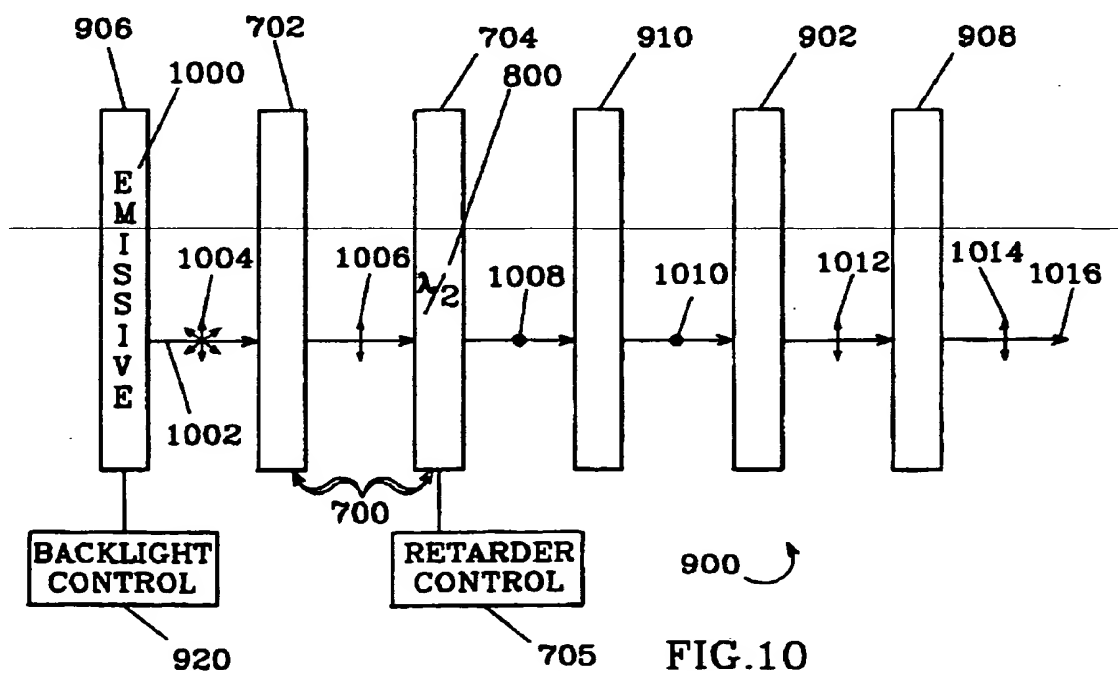
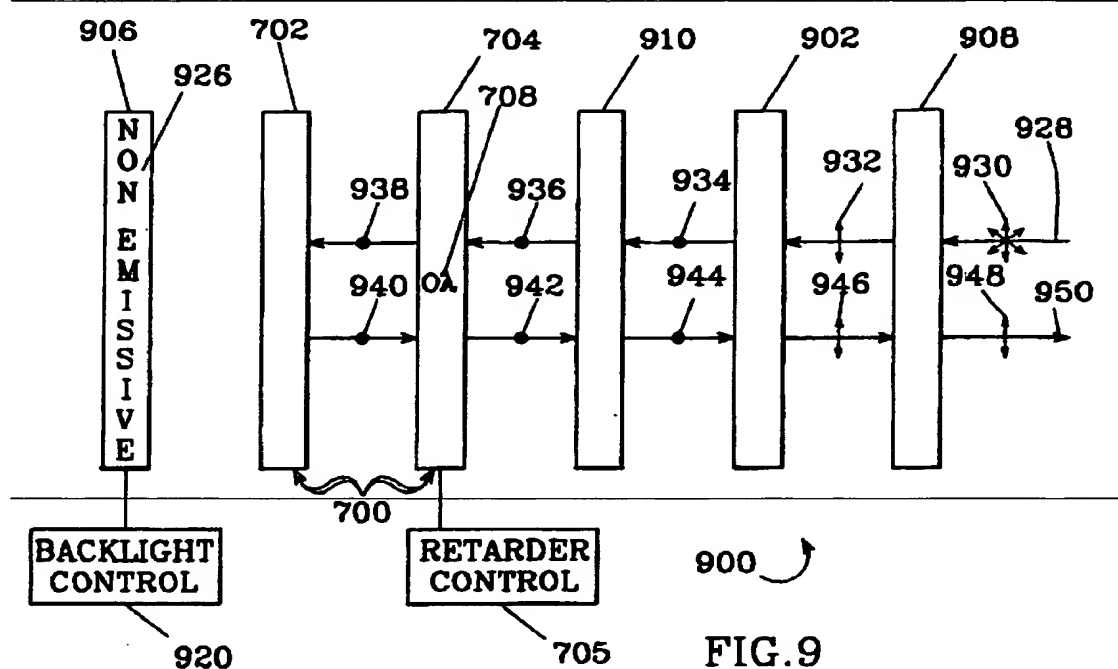


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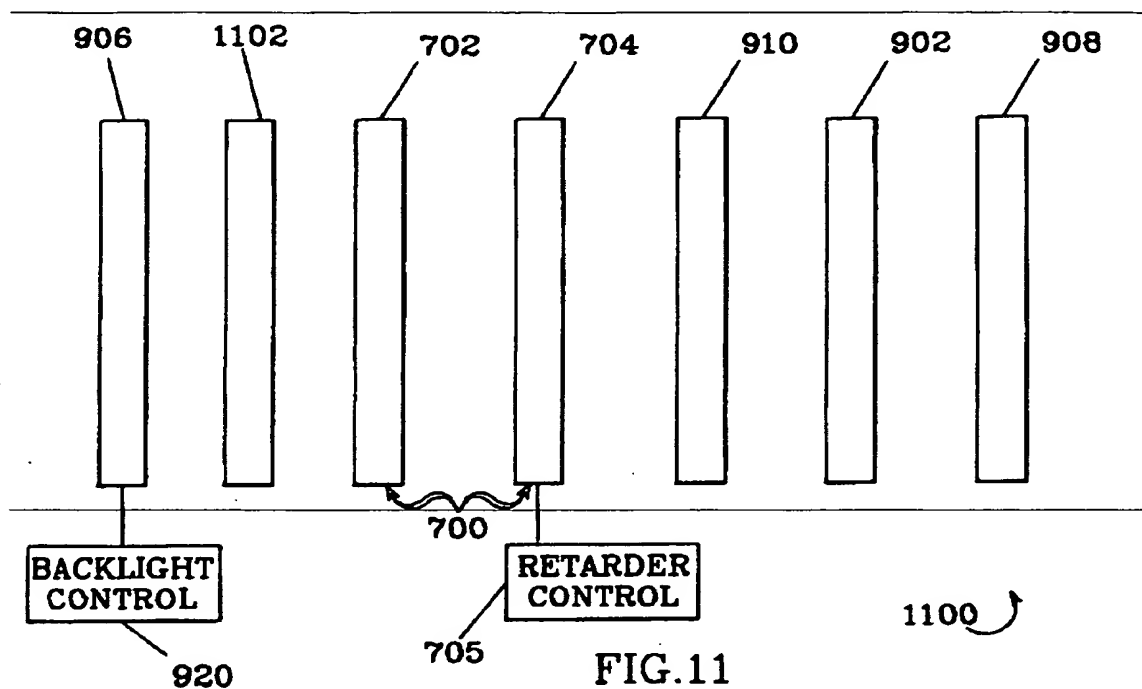


FIG. 11

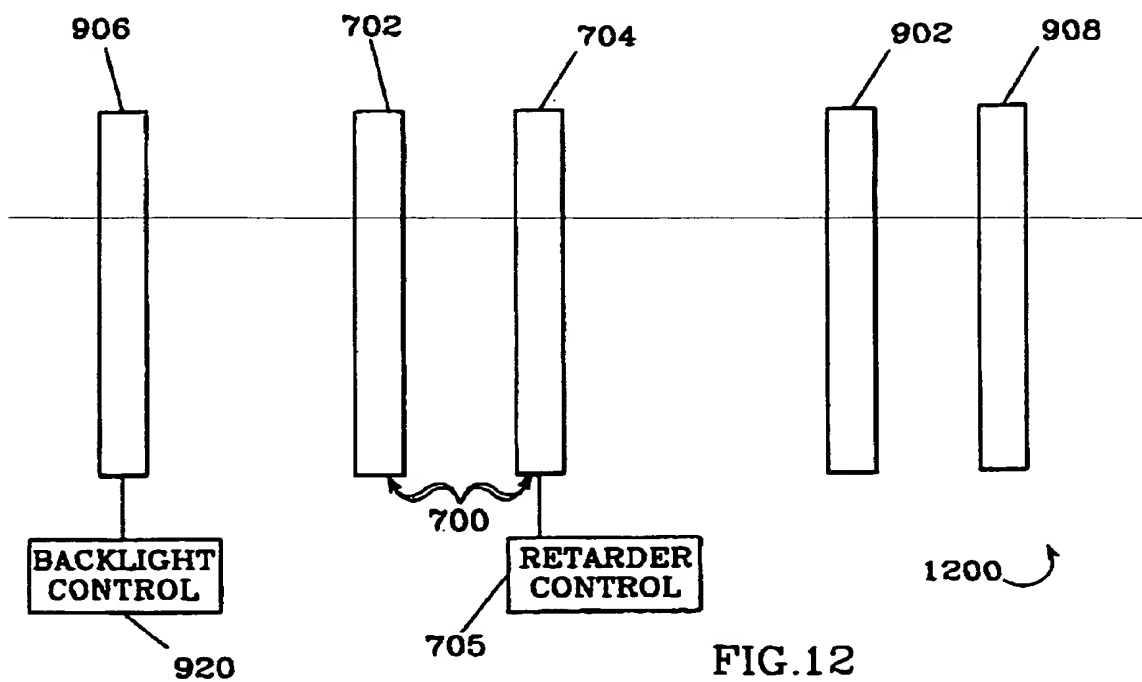


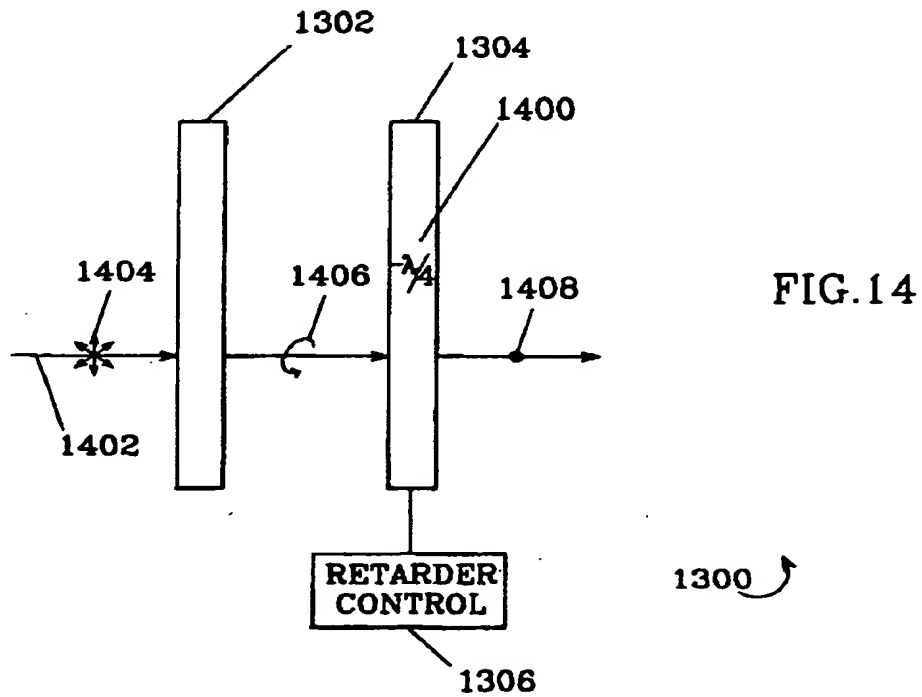
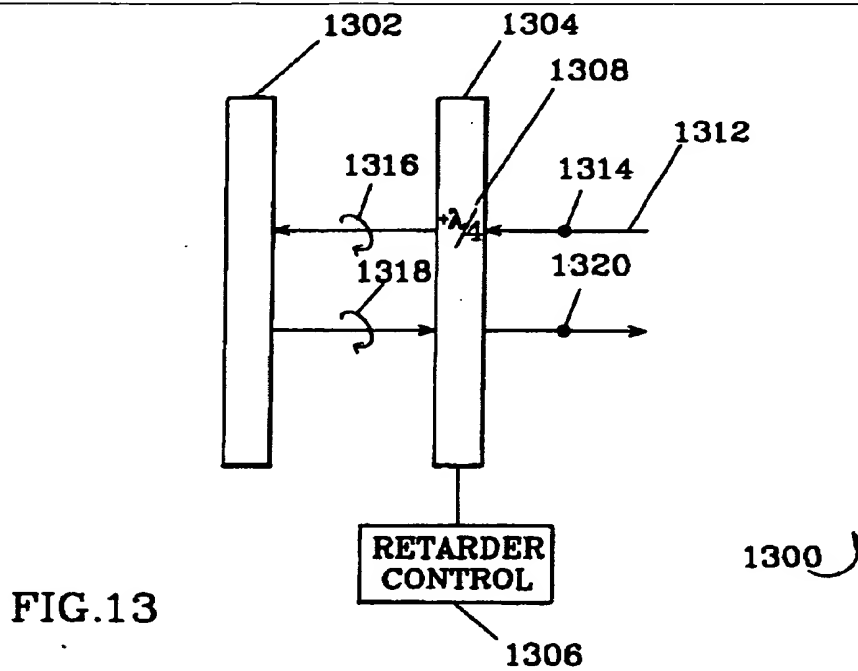
FIG. 12

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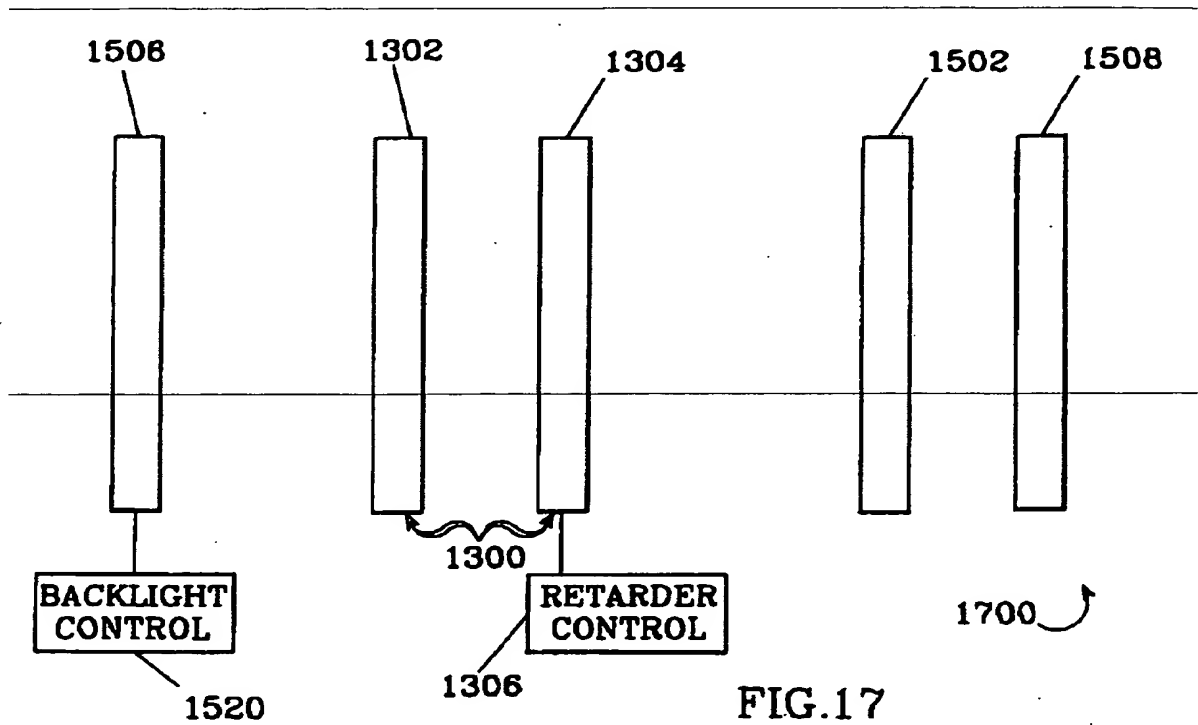


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FIG. 18a

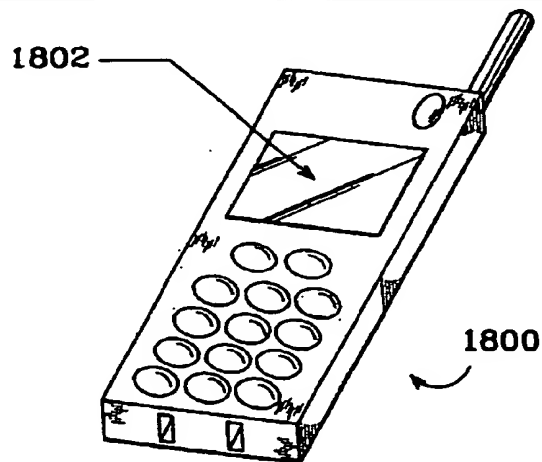


FIG. 18b

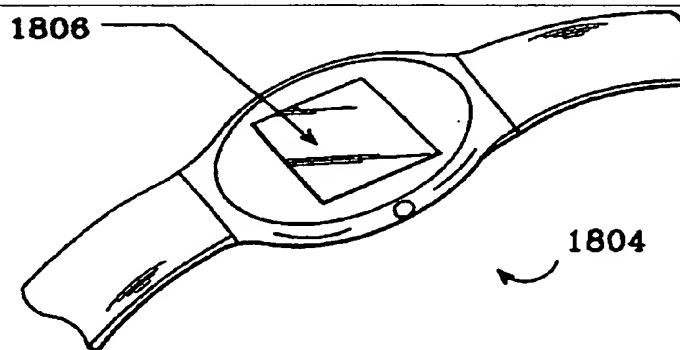


FIG. 18c

